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A Comparison of U.S. and Chinese University Students' Cognitive Development: The Cross-Cultural Applicability of Perry's Theory

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ABSTRACT. The cross-cultural generalizability of William Perry's (1970) theory of intellectual and ethical development was examined via the Zhang Cognitive Development Inventory (ZCDI; L. F. Zhang, 1995, which is based on Perry's theory), with 3 samples of college students, 1 from the United States and 2 from the People's Republic of China. The ZCDI was shown to be reliable and valid for all 3 samples. The results indicated that the Chinese college students' cognitive–developmental pattern differed from that proposed by Perry, but the U.S. students' pattern did not. Possible reasons for the different cognitive–developmental pattern of the Chinese students are presented, leading to the conclusion that Perry's scheme is not universal. Instead, students' cognitive–developmental patterns seem to vary as a function of different cultural and education systems. The implications of these results are discussed in relation to student affairs practice.

AS THE STUDENT POPULATION in the United States has grown increasingly culturally diverse (Fenske & Hughes, 1989; Pedersen, 1991; Talbot, 1996), it has become crucial that student affairs professionals in higher education understand the differences among students from dissimilar cultural backgrounds. In this article, I discuss William Perry's (1970) theory of intellectual development and cultural dimensions that I believe have caused the different cognitive–developmental patterns of U.S. and Chinese college students.

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Numerous studies have been conducted to find ways to improve college students' higher order reasoning (e.g., Allen, 1983; Brookfield, 1987; Imrie, 1995; King, Kitchener, & Wood, 1994; Lawson, 1980; Mines, 1980/1981). Much of this research is based on one of the following models: Erikson's (1968) psychosocial developmental model, Kohlberg's (1969) model of moral development, and Perry's (1970) theory of ethical and intellectual development. Each of these models may be used to study a specific aspect of students' development during their college education.

In delineating conditions for student development, the aforementioned theorists seem to agree that "the resolution of developmental crisis is encouraged by optimal dissonance" (Evans, 1996, p. 173). *Optimal dissonance* is defined as a moderate, growth-enhancing level of discomfort with one's current functioning. For example, when Smith (1978) discussed the practical implications of Kohlberg's (1969) model of moral development, he argued that one of the most important ways for students to develop morally is for them to be challenged by moral dilemmas. Berk (1996), discussing the impact of Piaget's theories of education, stated that choosing freely among different activities is one of the conditions critical for children's intellectual development. There is also strong evidence that cognitive development is enhanced by working through decision-making procedures (successfully meeting challenges) and that inadequate experience may interfere with cognitive development (e.g., Batchelder & Root, 1994; Gordon, 1990; Petersen, Leffert, & Graham, 1995).

Adopting an epistemological approach, William Perry (1970) constructed a theory that specifically aimed at tracing the development of college students' ways of making sense of their own experiences. Consisting of nine positions, this theoretical scheme describes the steps through which students move from a simplistic, categorical view of the world to a realization of the contingent nature of knowledge and of relative values, and to the formulation and affirmation of their own commitments. The nine positions of cognitive development can be classified into three general categories: dualism, relativism, and commitment.

There are four major constructs in Perry's (1970) theory. First, Perry believed that an individual's forms of reasoning transcend their content domains. That is, a student uses ways of reasoning that remain consistent, regardless of the content that is presented. Second, an individual's less adaptive forms of reasoning are progressively replaced by more adaptive forms. Thus, individuals should occupy one dominant cognitive–developmental position at a given time. Third, the development of an individual's ways of reasoning is the result of the interaction between that individual's expectancies and the structure of the environment. Fourth, as they proceed through college, students move from lower levels of reasoning to higher levels. The fourth construct (which is the focus of the current article) as well as the first three constructs, has been supported by previous studies (e.g., Clinchy, Lief, & Young, 1977; Parker, 1984; Touchton, Wertheimer, Cornfield, & Harrison, 1977) in the United States, as they were in Perry's original study.

Unlike some stage theorists, who believed that cognitive–structural stages follow invariant sequences that are not defined by culture (e.g., Ginsburg & Opper, 1988; Opper, 1977), Perry (1970) took an interactionist view. He argued that a college environment can connect with students in certain ways that encourage them to develop cognitively along his scheme. When King (1978) discussed the applicability of Perry's scheme to the design and implementation of student development programs, she put great emphasis on decision making. Rodgers (1989) reiterated that cognitive–developmental change results from cognitive conflict. That is, a challenge presented to a person's current way of making sense is one of the conditions necessary for that person's cognitive development. Rodgers postulated four conditions that must be met for an environmental challenge to facilitate growth. In line with these interactionists, I argue that the different cultural and education systems in the People's Republic of China and the United States may create different learning environments that, in turn, lead to different cognitive–developmental patterns.

Cross-cultural studies have indicated that there are cultural and environmental influences on cognitive development (e.g., Mwamwenda, 1992; Rogoff & Chavajay, 1995; Slone, Dixon, & Bokhorst, 1993; Victora, Victora, & Barros, 1990; Watkins & Regmi, 1996). Although research on Perry's (1970) theoretical constructs and their applications has been well documented in the student development literature (for details, see Parker, 1984; Zhang, 1995), the few non-U.S. studies that were found were restricted to other Western countries (e.g., Durham, Hays, & Martinez, 1994). Other research on Perry's theory, aiming at examining differences in diverse populations, has been limited to gender issues (e.g., Baxter-Magolda, 1995). Little research on Perry's theory has been conducted in non-Western countries.

This article is based on three related studies. The primary goal was to examine the generalizability of Perry's (1970) theory in Chinese culture. With three samples of students from China and the United States, this goal was achieved by (a) investigating the internal reliabilities of the scales and subscales of the Zhang Cognitive Development Inventory (ZCDI; Zhang, 1995), which is based on Perry's scheme; (b) assessing the validity of the ZCDI for measuring the levels, according to Perry's scheme, of the three samples of university students; and (c) identifying the patterns of cognitive development of the three groups of students.

Method

Instruments

The ZCDI is based on the four major constructs in Perry's (1970) theory of ethical and intellectual development. A process of translation and back translation was used, resulting in parallel Chinese and English versions. The procedures included (a) developing an item pool, (b) examining the items for cultural appro-

priateness, (c) establishing content validity, (d) subjecting the item pool to item analysis procedures, (e) pretesting and administering an initial form of the instrument, and (f) constructing the final research instrument (for details, see Zhang, 1995). The instrument went through four different forms in Chinese and English.

The ZCDI contains 120 items that address four content areas (education, interpersonal relationships, career choice, and life responsibility). The content areas fall into three categories of reasoning defined by Perry's theory: dualism (62 items), relativism (40 items), and commitment in relativism (18 items). Dualism and relativism items are given more emphasis because these stages are most common among undergraduates (see Knefelkamp, 1974; Widick, 1975; Widick, Knefelkamp, & Parker, 1975). The instrument contains nine subscales: Education/Dualism, Education/Relativism, Interpersonal Relationship/Dualism, Interpersonal Relationship/Relativism, Career/Dualism, Career/Relativism, Education/Commitment, Career Choice/Commitment, and Life Responsibility/Commitment; each is part of one of the three overall position scales (Dualism, Relativism, and Relativism in Commitment).

Participants indicated their degree of agreement with each of the statements on a 4-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (4). One sample item from each of the nine subscales is given in Table 1.

TABLE 1
Sample Items From the Zhang Cognitive Development Inventory

Sample item	Scale type
The key to understanding a course is learning to think the way the teacher wants you to think.	Education/Dualism
I like projects where I can study different views or ideas.	Education/Relativism
I would like to have one close friend at a time.	Interpersonal/Dualism
I enjoy talking with almost all people, regardless of their age, sex, or profession.	Interpersonal/Relativism
I absolutely need to do the kind of work for which I am being prepared.	Career/Dualism
My eventual career commitment will be made from among several good possibilities.	Career/Relativism
I regularly read a magazine or book related to my courses even if they are not required by my instructor.	Education/Commitment
I see how I will be able to use what I am studying in my future career.	Career/Commitment
I have assumed major responsibilities in several areas of my life.	Life Responsibility/Commitment

Participants and Procedure

According to Perry's theory, college students in their freshman and sophomore years should score significantly higher on dualism and lower on relativism and commitment in relativism than college students in their junior and senior years.

In 1994, the Chinese version of the ZCDI was administered to 808 university students enrolled in five higher education institutions in Beijing, China. Their responses revealed a pattern of student cognitive development that was the reverse of what was expected according to Perry's (1970) theory. That is, students who were freshmen and sophomores were at significantly higher levels of the Perry scheme than juniors and seniors were. In order to identify the possible reasons for this unusual cognitive–developmental pattern for the university students of that cohort, I conducted two more studies simultaneously, toward the end of 1996: The English version of the ZCDI was administered to 152 students at a small, private, midwestern college in the United States, and the Chinese version of the ZCDI was administered to 503 students at seven higher education institutions in Nanjing, China.

1994 Beijing sample. In the first study, 820 students from five higher education institutions of Beijing were recruited to complete the ZCDI as well as to provide some demographic information. The total number of students in the five institutions ranged from 8,000 to 10,000 at the two colleges and from 10,000 to 14,000 in the three universities. Of the 820 questionnaires, 808 were found suitable for data analysis; 31% had been completed by male students, and 69% by female students. The participants included 230 freshmen, 249 sophomores, 165 juniors, and 164 seniors. Fifty-one percent (n = 413) of the students were studying science and technology, and 49% (n = 395) were studying social sciences and humanities. The ages of the participants ranged from 17 to 26 years, with a mean of 20 years and a median of 21.

1996 U.S. sample. The participants in this sample were 152 college students (125 men and 27 women) from a small private college in the midwestern United States. Among these students, 53 were freshmen, 37 were sophomores, 33 were juniors, and 29 were seniors. Seventy-two students were majoring in science and technology and 76 in social science and humanities (4 students were unspecified). For this sample, the ages ranged from 17 to 29 years, with a mean of 19.6 years and a median of 19.5.

1996 Nanjing sample. For this study, 503 college students (263 men, 234 women, 6 unspecified) responded to the ZCDI. These students were enrolled in seven different universities (populations ranging from 8,000 to 14,000) in Nanjing, China, during the 1996 fall semester. Among these respondents, there were 124 freshmen, 125 sophomores, 129 juniors, and 120 seniors (5 were unspecified). Two

hundred and seventy-nine students were studying in the areas of science and technology and 216 in social science and humanities (8 were unspecified). The ages for this sample ranged from 17 to 25 years, with a mean of 20.4 years and a median of 20.

Data Analysis

For each of the three sets of data, the following statistical procedures were used to study the research questions: The internal consistencies of the ZCDI scales and subscales were estimated with Cronbach alpha coefficients. An exploratory factor analysis with a varimax rotation was conducted to examine the constructs from Perry's (1970) theory underlying the ZCDI. One-way analysis of variance (ANOVA) procedures were used to study the mean differences among the four college class levels. The Scheffé procedure was used for post hoc comparisons.

Results

Reliabilities for Scales and Subscales

The alpha coefficients for the ZCDI scales and subscales are reported in Table 2. For all three samples, the alpha coefficients for the three position scales (Dualism, Relativism, and Commitment in Relativism) were considered sufficiently high to allow further data analysis. In addition, for all three samples, the subscales with fewer items (three to seven items) yielded lower alpha coefficients.

TABLE 2
Alpha Coefficients for the Scales, by Sample

Scale/subscale	Number of items	Beijing (N = 808)	U.S. (N = 152)	Nanjing (N = 503)
Education/Dualism	28	.71	.77	.73
Education/Relativism	18	.58	.57	.62
Interpersonal Relationship/Dualism	27	.67	.81	.70
Interpersonal Relationship/Relativism	18	.52	.58	.49
Career Choice/Dualism	7	.20	.30	.29
Career Choice/ Relativism	4	.23	.48	.28
Education/Commitment	7	.47	.25	.54
Career Choice/Commitment	3	.28	.46	.35
Life Responsibility/Commitment	8	.58	.56	.55
Dualism (overall positional)	62	.80	.88	.83
Relativism (overall positional)	40	.72	.71	.71
Commitment (overall positional)	18	.68	.61	.72

Factor Analysis

The results obtained from the exploratory factor analysis followed by a varimax rotation used for each of the three samples are reported in Table 3. For both Chinese samples, the scree tests indicated that a two-factor solution would be appropriate (Cattell, 1966). Furthermore, for both Chinese samples, there were two eigenvalues greater than 1 and, thus, two factors were retained in both samples. The two factors accounted for 51.6% of the variance for the Beijing sample and 52.9% for the Nanjing sample. In both samples, Factor 1 showed high loadings for higher levels of reasoning (relativism and commitment in relativism), and Factor 2 manifested high loadings for a lower level of reasoning (dualism).

For the U.S. sample, the scree test indicated that a three-factor solution would be appropriate. Moreover, three eigenvalues were identified as greater than 1 and, therefore, three factors were retained. The three factors accounted for 63.7% of the variance. Each of the three factors was characterized by a different level of reasoning, as defined by Perry's (1970) theory. The first factor showed high loadings on reasoning at the dualistic level. The second factor showed high loadings on commitment in relativism. The third factor was characterized by relativism.

Group Differences

The three sets of mean differences in the subscales of the three samples are reported in Table 4. Results from the U.S. sample indicated no significant differ-

TABLE 3
Varimax Rotated Factor (F) Model for Each Sample

	Beijing		U.S.			Nanjing	
Subscale	F1	F2	F1	F2	F3	F1	F2
Education/Dualism	.02	.82	.87	.06	.06	−.06	.86
Education/Relativism	.74	.12	−.14	.31	.71	.75	.07
Interpersonal Relationship/Dualism	−.01	.82	.83	.04	−.15	−.07	.84
Interpersonal Relationship/Relativism	.66	−.06	−.53	.23	.46	.60	−.17
Career Choice/Dualism	.14	.62	.67	.26	.04	.15	.64
Career Choice/Relativism	.63	.17	.09	−.13	.83	.55	.12
Education/Commitment	.72	−.32	−.47	.58	−.02	.68	−.40
Career Choice/Commitment	.61	.15	.15	.77	.00	.73	.08
Life Responsibility/Commitment	.64	.08	.25	.74	.26	.68	.02
% of variance	30.4	21.2	28.5	22.5	12.7	30.7	22.3
Cumulative %	30.4	51.6	28.5	51.0	63.7	30.7	52.9
Eigenvalue	2.74	1.91	2.56	2.02	1.14	2.76	2.00

TABLE 4
Analysis of Variance and Post Hoc Comparisons for Scales and Subscales

Sample	ED	ER	ID	IR	CD	CR	EC	CC	LC	D	R	C
						Beijing, N = 808						
Freshmen	2.32^{ww}	2.87^{hh}	2.38^{www}	2.70^{h}	2.56	3.09^{hh}	3.09^{hh}	2.86^{h}	2.78^{h}	2.38^{ww}	2.81^{hh}	2.91^{hhh}
Sophomores	2.43^{h}	2.84^{h}	2.46^{h}	2.69^{h}	2.50	3.03^{hh}	2.94^{hhw}	2.86^{h}	2.72	2.45^{h}	2.79^{h}	2.83^{hhw}
Juniors	2.42^{h}	2.72^{ww}	2.52^{h}	2.61^{ww}	2.49	2.89^{ww}	2.77^{ww}	2.77	2.62^{w}	2.47^{h}	2.69^{ww}	2.71^{ww}
Seniors	2.38	2.79^{w}	2.46^{h}	2.65	2.50	2.88^{ww}	2.76^{ww}	2.72^{ww}	2.70	2.43	2.74^{w}	2.72^{ww}
p	.0013	.0001	.0001	.0089		.0001	.0001	.0134	.0045	.0011	.0001	.0001
						U.S., N = 152						
Freshmen	2.28	2.88	2.03	2.84	2.54	3.13	2.77	2.80	2.96	2.20	2.88	2.86
Sophomores	2.21	2.83	1.99	2.90	2.60	2.99	2.85	2.90	2.90	2.16	2.88	2.88
Juniors	2.29	2.83	2.07	2.78	2.63	3.10	2.81	2.92	2.94	2.23	2.83	2.88
Seniors	2.13	2.79	2.05	2.75	2.53	3.04	2.86	2.87	2.90	2.14	2.79	2.89
						Nanjing, N = 503						
Freshmen	2.28	2.89	2.29^{ww}	2.74	2.53	2.98	3.00	2.76	2.78	2.30^{w}	2.84	2.86
Sophomores	2.32	2.85	2.38	2.73	2.52	3.03	2.99	2.79	2.81	2.36	2.82	2.89
Juniors	2.32	2.87	2.43^{h}	2.68	2.46	3.06	2.97	2.81	2.77	2.38	2.81	2.81
Seniors	2.38	2.84	2.45^{h}	2.73	2.47	3.02	2.96	2.83	2.83	2.42^{h}	2.81	2.90
p			.0000							.0122		

Note. ED = Education/Dualism. ER = Education/Relativism. ID = Interpersonal Relationship/Dualism. IR = Interpersonal Relationship/Relativism. CD = Career Choice/Dualism. CR = Career Choice/Relativism. EC = Education Commitment. CC = Career Choice/Commitment. LC = Life Responsibility/Commitment. D = Dualism. R = Relativism. C = Commitment.

^{h}Group mean is significantly higher than one other group mean. ^{hh}Group mean is significantly higher than two other group means. ^{hhh}Group mean is significantly higher than three other group means. ^{w}Group mean is significantly lower than one other group mean. ^{ww}Group mean is significantly lower than two other group means. ^{www}Group mean is significantly lower than three other group means. ^{hhw}Group mean is significantly higher than two other group means and significantly lower than a third group mean.

p values are omitted for group means that are not significantly different.

ences among students at different class levels. However, the results from the two Chinese samples indicated, to different degrees, a cognitive–developmental pattern that was reversed from the one that Perry described. Unlike what was expected according to Perry's theory, Chinese students from lower college classes manifested significantly higher levels of reasoning on the Perry scheme than those from upper college classes.

In the Beijing sample, all ANOVA results but the one for the Career Choice/Dualism subscale showed a significantly reversed pattern of cognitive development among participants of different college classes. Furthermore, of the 11 significant results obtained from eight subscales and three overall position scales, the means of all but those of Education/Dualism and subsequently Dualism were in the order of freshmen, sophomores, seniors, and juniors, with dualism being ordered from lowest to highest and relativism and commitment in relativism from highest to lowest.

In the Nanjing sample, this reversed pattern became less salient. Instead of finding significant reversed patterns on all but one subscale, I identified this reversed developmental pattern on only one of the three positional scales and one of the subscales (Dualism and Interpersonal Relationship/Dualism), findings that certainly contributed a great deal to the results on the overall positional scale (Dualism).

Discussion

In general, the students' cognitive–developmental patterns found in the 1994 and 1996 Chinese samples were not in agreement with that described in Perry's (1970) theory. Furthermore, the reversed cognitive–developmental pattern was less obvious in the 1996 sample than it was in the 1994 sample. In this discussion, I emphasize first the cultural and education dimensions that may have led to the differential cognitive–developmental patterns of the Chinese and U.S. college students. Second, I present the differences and similarities between the results found in the two Chinese samples. The value of decision making is central to the discussion.

In his original theory (as mentioned earlier), Perry (1970) argued that cognitive development results from the interaction between a person and his or her environment. The cognitive–developmental pattern found among the Chinese college students, different from that of the U.S. students, could be attributed to a number of cultural dimensions as they relate to the differences between the Chinese and U.S. education systems. In each dimension, the Chinese students were not provided with enough opportunities to make their own decisions, whereas the U.S. students were challenged to make up their own minds.

The first dimension has to do with different enrollment systems. Chinese students enter college with predetermined majors that are overspecialized (Min, 1997). In contrast, in the U.S. education system, students are allowed to choose

their areas of study after sufficient exploration of their interests in different subjects.

The second dimension relates to curriculum and instruction. Until recently, Chinese college graduates were "trained as elements of the planned economy" (Min, 1997, p. 41). The students were restricted in very narrow fields of specialization. A system of compulsory curriculum was implemented (Du, 1992). In addition, the courses within each curriculum were taught mostly by "uninterrupted lectures with no student participation in discussion" (Lewin, Hui, Little, & Zheng, 1994, p. 138). In contrast, U.S. students fully enjoy the credit system. They make up their own curricula. Moreover, instruction is characterized by a variety of types of student involvement, including group projects, discussions, and seminars.

Related to both enrollment systems and curricula are class systems and residential conditions, both affecting peer interactions. In China, college students entering in the same department are divided into several class sections, and they stay in those same class sections for the entire college period. In the United States, because students choose their own courses, they go to different classes and meet new classmates, including students from different fields of study. In terms of residential conditions, Chinese students are assigned to a room that is shared by seven students for their entire college period. U.S. students may make residential choices, including residence halls, fraternities and sororities, or rented houses or apartments that are shared.

Another cultural dimension has to do with China's practice of job assignment, as opposed to job choice in the United States. The tradition of China's job assignment is best illustrated by the following quotation (Lewin et al., 1994):

> After 1949, the government introduced a unified system of job assignment for college graduates to complement the state planning of the economy. The Decision on Reform of School System issued by the Government Administrative Council on 1 October 1951 clearly stipulated that college graduates "will be assigned jobs by the government." From then on, this fundamental principle has remained unchanged except for the period of the Cultural Revolution. (pp. 131–132)

Since the middle of the 1980s, the Chinese government has been trying to reform the job assignment practice. However, at best, these reforms have resulted in different strategies for job assignment. The students are left with no choice at all. In contrast, students in the United States have access to career guidance, career counseling, and career choice.

In summary, the aforementioned cultural and education dimensions have restricted Chinese students' opportunities for decision making, and this limitation may have led to the unusual trajectory of their cognitive development, according to Perry's theory. The impact of these cultural and education dimensions is further evidenced by the difference found between the 1994 Beijing sample and the 1996 Nanjing sample. Although the former revealed a reversed pattern of cogni-

tive development on all three scales, the latter revealed it on only one scale. In this light, the Chinese students' cognitive development was progressing according to Perry's scheme. What could have contributed to this progression?

I would argue that this progression comes from three of the major education reforms currently occurring in China. First, many Chinese higher education institutions, including those in Nanjing, are in the process of establishing a credit system. Second, in the early 1990s, universities were assured that they could "redefine the goals of different specialties, draw up teaching plans and syllabi and compile and select different materials" (Hayhoe, 1991, p. 115). The aim of this effort was to make each specialization more inclusive, so that students would gain knowledge from a broader area. In the near future, this effort will be continued (announced on the China Central Television in May 1997). Third, students are beginning to play more active roles in their job selections. They are provided with the opportunities to have direct meetings with their potential employers (Lewin et al., 1994; Min, 1997). To various degrees, all of these reforms provide students with greater opportunities to make their own decisions.

However, these reforms are all at their initial stages, and there are limitations that continue to restrict students' opportunities for decision making. First, Chinese students are still enrolled in college with predetermined majors. Second, the reorganization of specialties and the establishment of a credit system may have granted students some freedom of choice, but "whatever the form of curriculum revision, a large measure of success was going to depend on molding methods of instruction by the same spirit governing the curriculum revision" (Brubacher & Rudy, 1976, p. 280). In Chinese classrooms, instruction is still largely teacher centered. Third, even though the job-assignment practice is disappearing, students are not being challenged to make their own decisions. In fact, there is neither career guidance nor career counseling. Furthermore, to succeed in the competition for good jobs, students have to focus even more on their academic work; hence, they have less freedom to broaden their studies (Lewin et al., 1994). As a result, the Chinese students in the more recent study continued to show a cognitive–developmental pattern that was different from what was expected, according to Perry's theory.

Conclusions and Limitations

This triadic study indicates that Perry's (1970) scheme cannot be generalized to the Chinese culture. The discrepancy identified can be accounted for by the cultural and education dimensions that have deprived Chinese college students of their opportunities for decision making. However, the arguments presented here represent only certain ways of interpreting the data. Of course, they are not the only ways.

There are several major limitations to this study. First, the reliability coefficients were low for some subscales that included fewer items. The second limi-

tation has to do with the two particular samples of Chinese students. Complete randomization of sampling could not be obtained. Third, the Nanjing study was carried out 2 years after the Beijing study. The results from the Nanjing study did indicate some change in the stages of student cognitive development, according to Perry's scheme. However, whether this progress is related to the increasing opportunities for students to make decisions or to another factor has yet to be investigated. Fourth, one of the major criticisms of Perry's work involves gender bias, because Perry's conclusions were based on data collected solely from male participants. Given that the current study is based on Perry's theory, it may reflect a bias against female participants.

Last, unlike data from some of Perry's (1968, 1970) earlier research, data from the U.S. sample in the current study did not yield any statistically significant results. The reason for this finding is not yet clear. It could be attributable to the fact that this study had a small, homogeneous sample. Perhaps, with the changing values in U.S. society, certain significant changes are taking place in its higher education system. For example, because of the reality of the job market, many students go into majors such as computer science and finance at the beginning of their college programs. This trend would certainly minimize students' exploration of other areas.

Even with these limitations, this study did indicate that Perry's theory cannot be applied universally. Instead, the results revealed that when opportunities for making choices are provided within cultural and education systems, a significant impact is made on students' cognitive development.

Implications for Student Affairs Practice

This information about the differences between U.S. and Chinese college students can be useful to student development professionals. First, an awareness of the differences could help a Chinese student adapt to U.S. culture. Professionals who know that Chinese college graduates tend to think in concrete terms should not only provide clear guidelines but also present the students with multiple views that challenge them to go one step further. Such information could also aid faculty members in working with Chinese students more effectively. For example, knowing that Chinese students are accustomed to a teacher-centered teaching method, faculty members may understand that a Chinese student tends not to participate in class discussion. The faculty member could then use other strategies to get the student involved.

Similarly, this information could have implications for student development professionals who work with U.S. students interested in gaining some learning experience in China. Being used to freedom of choice in their academic work and interpersonal relations, U.S. students may experience a great sense of constraint in China. A U.S. student studying in China would be extremely confused if he or she tried to maintain interpersonal freedom and student-centered learning meth-

ods. Student development professionals can make these U.S. students' experiences in China easier by advising them of such cultural differences.

More important, because U.S. higher education, like the United States itself, is known as a melting pot, students from all over the world go there to study. Each cultural group is different from the others in many ways, including cognitive development. Therefore, it is crucial for both faculty and student development professionals to be aware of these differences and try to accommodate them by teaching in a variety of styles and by designing a variety of student development programs.

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